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IMPORTANT FOREST INSECT OUTBREAKS

California Region, 1959

California faces one of its most serious bark-beetle epidemics in more than a decade. Infestations have shown a very marked increase in many parts of the State during 1959. Most of the increase has been due to the activities of the mountain pine beetle in sugar, lodgepole and ponderosa pines; the western pine beetle alone and in combination with the California five-spined engraver in ponderosa and Coulter pines; the Jeffrey pine beetle in Jeffrey pine; the fir engraver in white and red firs; and the Douglas-fir engraver in Douglas-fir.

Prolonged dry and unseasonably warm weather during the last 12 months have favored an increase in beetle populations. Additional contributing factors favorable to the buildup were the presence of numerous lightning-struck trees, the abundance of snow-broken tops, and the accumulation of favorable breeding material left in road construction, pole-line cuttings, and logging operations. Barring a prolonged period of very cold weather, continued severe damage from bark beetles is anticipated in 1960.

One encouraging aspect of the loss picture is that areas treated by sanitation-salvage in the eastside pine type show little evidence of increased losses, except for the occurrence of lightning-struck trees which have been attacked by bark beetles. Logging infested trees has been helpful in checking potentially serious infestations in some outbreak areas; in other areas, other methods of direct control have been beneficial.

Western pine beetle - *Dendroctonus brevicomis* Lec.

Hosts: Ponderosa pine and Coulter pine

Current conditions: Damage to ponderosa pine in northern California and to Coulter pine in southern California has been severe and widespread. Outbreaks in ponderosa pine occurred in the McCloud area, Siskiyou County, where over 1 million board feet was infested; in the Burney-Hat Creek area, Shasta and Lassen Counties, where 2½ million board feet of insect-killed timber has already been salvaged and marking of additional infested timber is underway; in Slate Creek, Tehama County, where ½ million board feet of infested timber was salvaged and several thousand unmerchantable trees treated with chemicals; and on the Sierra National Forest where heavy concentrations of loss occurred in a zone from 4,000 to 6,000 feet. In this area, groups of infested trees were most abundant around Bass Lake, in the Lewis Creek basin, Cedarbrook-Hugh Ryan area, Cascadel, and Chiquito basins. Other areas of less magnitude include the McGee Burn, Fresno-Tulare Counties, where outbreaks are again occurring; and the Chamber Creek Burn, Plumas County, where it was estimated that 500 infested trees occurred on several hundred acres.

Infestations in Coulter pine were widespread in southern California. One of the heaviest concentrations of loss occurred in the San Jacinto area, Riverside County, where a recent survey showed an estimated 1,339 faded trees on some 15,000 acres.

Trend: Sharp increase statewide.

Mountain pine beetle - *Dendroctonus monticolae* Hopk.

Hosts: Lodgepole, ponderosa, and sugar pines

Current conditions: Mountain pine beetle infestations in sugar pine were at their highest in more than a decade. Large groups of infested trees were common, particularly in the southern part of the Westside Sierra subregion. Losses were especially heavy in Calaveras, Tuolumne, Mariposa, and Madera Counties. Similar losses, although not so widespread, occurred further north in Shasta and Yuba Counties.

Losses in lodgepole pine continued to increase in areas where the mountain pine beetle was in outbreak in 1958, and several new centers of infestation were detected. Older areas where heavy infestations persisted included parts of Yosemite and Lassen Volcanic National Parks and the Skunk Cabbage Creek drainage on the Modoc National Forest. A recent appraisal in Yosemite National Park showed nearly 1,000 infested trees on about 1,300 acres in the Delaney Creek drainage - a twofold increase over the number in the same area one year ago. New centers of infestation were detected near Silver Lake, Plumas County, where a recent survey disclosed 250 currently infested trees on 100 acres; along the Military Pass Road, Siskiyou County; Hobart Mills, Nevada County; and near Cathedral Lake in Yosemite National Park.

Localized outbreaks of the mountain pine beetle in pole stands of ponderosa pine were detected in the Warner Mountains, Modoc County. Infestations were especially heavy in Joseph Creek basin where in excess of 1,000 infested trees occurred on about 1,000 acres; also in the Fort Bidwell-Mill Creek area where several thousand trees, some in very large groups, were found on 2,500 acres.

Trend: Upward in all tree species.

Jeffrey pine beetle - Dendroctonus jeffreyi Hopk.

Host: Jeffrey pine

Current conditions: This insect showed signs of increased activity in some parts of the State. At Cannell Meadows, Tulare County, an appraisal showed 21 million board feet of Jeffrey pine killed on about 100,000 acres. At Hessian Meadows, Tulare County, an outbreak occurred on about 10,000 acres on the Inyo National Forest. At Gold Lake, Sierra County, a 2,000-acre outbreak infestation was reported. Other localized infestations occurred at Summit Lake, Shasta County; in Lassen Volcanic National Park; and around Lake Arrowhead and Big Bear Lake, San Bernardino County.

Trend: Sharply upward in localized areas.

Pine engravers - Ips confusus Lec. and I. oregoni (Eichh.)

Hosts: Ponderosa, Coulter, Jeffrey pine and sugar pine

Current conditions: Damage from pine engravers, principally the California five-spined engraver, has increased greatly statewide. Pine engravers were associated with most of the important outbreaks of the western pine beetle in ponderosa and Coulter pines and, to a lesser degree, with the mountain pine beetle in sugar pine. In the following areas in southern California where drought has been severe, the California five-spined engraver killed Coulter pine without help of other insects: Indian Canyon, Orange County (about 100 trees killed); Corte Madera, San Diego County (about 85 trees killed, despite maintenance control). Some killing also occurred around Big Bear Lake, San Bernardino County, and at San Jacinto, Riverside County.

Trend: Continuing epidemic statewide.

Fir engraver - Scolytus ventralis Lec.

Hosts: White and red firs

Current conditions: Fir engraver infestations in red and white firs were mostly light, although in some localities losses were very heavy. Substantial damage attributed to this insect was detected at Trout Creek and Casa Vieja Meadows, Tulare County. At Bear Valley, Placer County, several thousand white fir trees in second-growth stands were killed on less than 1,000 acres.

Trend: Uncertain.

Douglas-fir beetle - Dendroctonus pseudotsugae Hopk.

Host: Douglas-fir

Current conditions: Douglas-fir beetle activity was at a relatively low level throughout most of California. In the Bald Hills, Humboldt County, where heavy broods were found in windthrown Douglas-fir, prompt salvage of 10 million board feet of the windthrown material is expected to reduce the possibility of damage to the green stand. The first infestation in the north central Sierra in several years was reported in the Lost Creek drainage, Plumas County.

Trend: No change.

Douglas-fir engraver - Scolytus unispinosus Lec.

Host: Douglas-fir

Current conditions: Late last winter and early this spring, infestations of the Douglas-fir engraver were common in Sonoma, Mendocino, and Humboldt Counties. Drought probably contributed to the increase. Some of the outbreaks appeared to be continuing during the fall months.

Trend: Slightly upward.

California flatheaded borer - Melanophila californica Van D.

Hosts: Jeffrey and ponderosa pines

Current conditions: Tree-killing by this insect was largely confined to Jeffrey pine in the recreational forests of southern California. Sanitation-salvage in certain localities, notably Barton Flats, Big Pines, Grade Valley and Alamo Mountain, has helped to hold losses down. In other high-use areas, direct control has kept infestations at a low level.

Trend: No change.

Lodgepole needle miner - Recurvaria milleri Busck.

Host: Lodgepole pine

Current conditions: This insect continued in outbreak on about 60,000 acres in Yosemite National Park, 1,300 acres in the Sequoia-Kings Canyon National Park, and 1,500 acres in the Emigrant Basin Wild Area on the Stanislaus National Forest. An undetermined acreage around Sentinel Meadows on the Inyo National Forest continued to be infested.

Some 3,400 acres of infested lodgepole at Tuolumne Meadows, Yosemite National Park, were sprayed by helicopter. Two pounds of malathion in 20 gallons of diesel oil per acre were applied. Spraying was done in two stages; about 800 acres were treated in July to control the moths and the balance was treated in August to control the new larvae as they emerged from the eggs. The moth spray gave an average control of 90 percent and the larval spray 70 percent.

Trend: Continuing highly epidemic.

Black pine-leaf scale - Aspidiotus californicus Coleman

Host: Sugar pine

Current conditions: Further evidence was accumulated this season on the association of this insect with yellowing foliage in sugar pine. Six new areas of infestation detected included Mill Creek, Mendocino National Forest; Thompson Peak and Big Bar, Shasta-Trinity National Forest; Hatchet Mountain, Shasta County; Hells Half Acre, Stanislaus National Forest; and Soap Creek Gap, Tuolumne County. In each of these areas sugar pine foliage was heavily infested. Although the ultimate effects of the scale on the trees are unknown, some land managers salvaged many of the more heavily infested trees.

Trend: Increasing.

Spruce budworm - Choristoneura fumiferana Clem.

Host: White fir

Current conditions: The spruce budworm in California occurred only in the Warner Mountains, Modoc County, where it has persisted for many years without causing any serious damage. Last year there was a noticeable increase in defoliation, and this year heavy defoliation occurred on an aggregate of about 2,000 acres of white-fir stands.

Trend: Increasing.

Seed and cone insects

Hosts: Jeffrey, ponderosa and sugar pines, Douglas-fir, true firs

Current conditions: Seed and cone insects have caused very serious damage to a generally light coniferous seed crop statewide. Practically all of the sugar pine cones were destroyed by the sugar-pine cone beetle, Conophthorus lambertianae Hopk. Other Conophthorus species severely damaged ponderosa and Jeffrey pine cones. Damage to the Douglas-fir seed crop was somewhat spotty, ranging from light in the western portion of the Douglas-fir region to very heavy in the eastern portion. Larvae of the cone moths, Dioryctria abietella (D.&S.) and Barbara colfaxiana (Kearf.), and a midge, Contarinia sp., were responsible for most of the Douglas-fir cone damage. The Douglas-fir seed chalcid, Megastigmus spermotrophus Wachtl, caused additional damage to the seed. Insect damage to the red and white fir seed crop was likewise very heavy.

Trend: Continuing at a high level.

Pine reproduction weevil - Cylindrocopturus eatoni Buch.

Hosts: Ponderosa and Jeffrey pine

Current conditions: Localized outbreaks of this weevil occurred in pine plantations in the Central Sierra. DDT sprays were applied to control the weevil in two plantations on the Stanislaus National Forest, totaling 2,000 acres, and on two smaller plantations on the Eldorado National Forest, totaling about 40 acres.

Trend: Continued local outbreaks.

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